The National Spatial Data Infrastructure of Zambia

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SUMMARY

One of Zambia's important challenges is to recognize the title of property owners on their land. The Ministry of Land, Natural Resources and Environment Protection (MLNREP) is in charge of managing the country's land resources. To begin a LAND AUDIT and to be efficient in charging the revenues, the Ministry has installed ZILMIS – the Zambia Integrated Land Management Information System. The MLNREP has contracted Sivan Design D.S Ltd to design and implement the system. One of the deficiencies in obtaining an ideal system is the absence of a good quality and up to date national map. To that end, Sivan Design is leading a joint venture together with another Israeli company – Ofek Aerial Photography and with Ground Force Land & Engineering Services, a surveying Zambian company that is in charge of quality control of the field surveys executed by the surveyors of the Ministry, under the Surveyor General. The goal of this JV is to create a National Spatial Data Infrastructure that will serve the Ministry, to maximize the usage of accurate geographical data for the benefit of the public serving both the Ministry and other E-GOVERNMENT initiatives.

Mapping is an essential element in the development of a country. Land Registration at high accuracy (Cadastral Scale) can serve as the hub for the nation development such as the development of roads, water resources, town planning, land uses, tourism, forestry, addressing etc. For Cadastral usages (land ownerships), an accurate map is the basic component for the management of a proper land allocation. It enables the surveyors and the land officers to properly identify the land parcel boundaries and its surroundings such as nearby roads, land uses and other affecting elements.

The objective of the NSDI is to

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in the ground all over the country by the Ministry's officers, sometimes by the aid of local workers.

The next step is aerial photography and acquisition of Satellite imagery. The raster dataset comprises orthophotos covering I ,800 square kms. of the 15 main cities of Zambia at a resolution of 10 cm per pixel, 36,500 square kms. of state land at 20 cm per pixel, 2,225 square kms. of Pleiades satellite imagery for 88 townships at 50 cm per pixel, and about 712,000 square kms. of Spot 6/7 imagery at 250 cm. per pixel for the whole country. All orthophotos are accompanied by DTMs at proper scales.

The accuracy of the background raster data allows for participatory parcellation at a smaller accuracy than required by the Zambian Land Act for final registration but parcel data that can be delineated from the orthophotos with additional conflict resolution on the ground is better than no data at all.

The system will be installed at 3 interconnected sites: The Ministry, The National Data Centre (NDC) which serves as a hub for e-government and at the National Remote Sensing Centre.

The NDC is the connection between the NSDI and the public. It hosts the NSDI Portal which is a toolset intended to serve the entire population of the Country, for those who do not have GISs to work with. For specialists, which have their own systems, 2 types of Web Map Services are available: an ESRI based service and a service adhering to OGS Standards.

Two specific web services connect the NSDI and ZILMIS (the land management system). The NDSI displays a geographical subset of ZILMIS's dataset, namely the Cadastre Layer, with data that can be publicly exposed without compromising citizen's privacy and in the opposite direction – ZILMIS uses the background raster data from the NSDI.

A very important aspect of the project is the Capacity Building of the Ministry's officers. The Ministry has insisted on specific measures that will ensure that its officers will be in full command of the data and the advanced processing procedures.

This is the main challenge of the Project as the Ministry has failed over and over again to find the funds to complete its part of the project, namely to fund the allowances for the field crews, petrol for the cars and allocating the proper equipment for executing the field surveys.

The data collected by this project is a national asset and is going to be managed and secured as such.